

FIG. 1

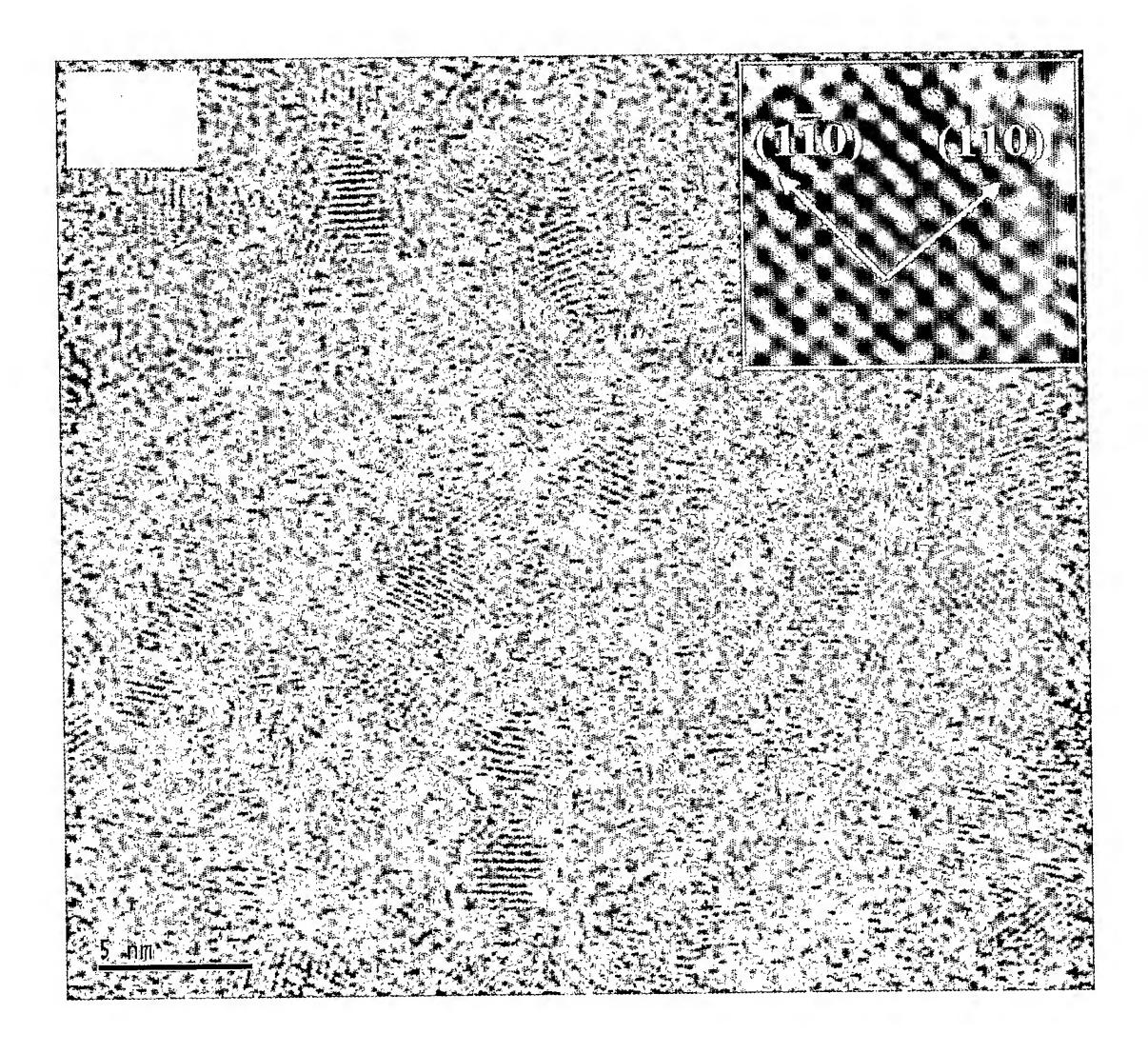


FIG. 2A

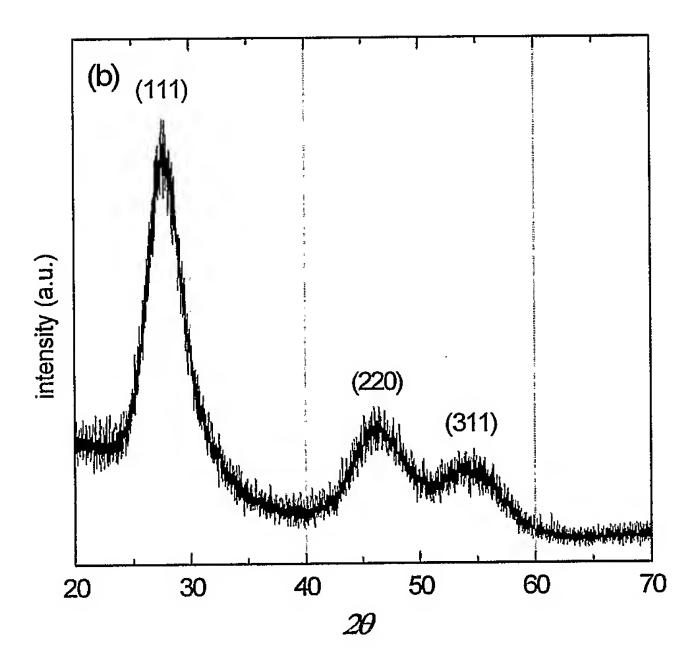
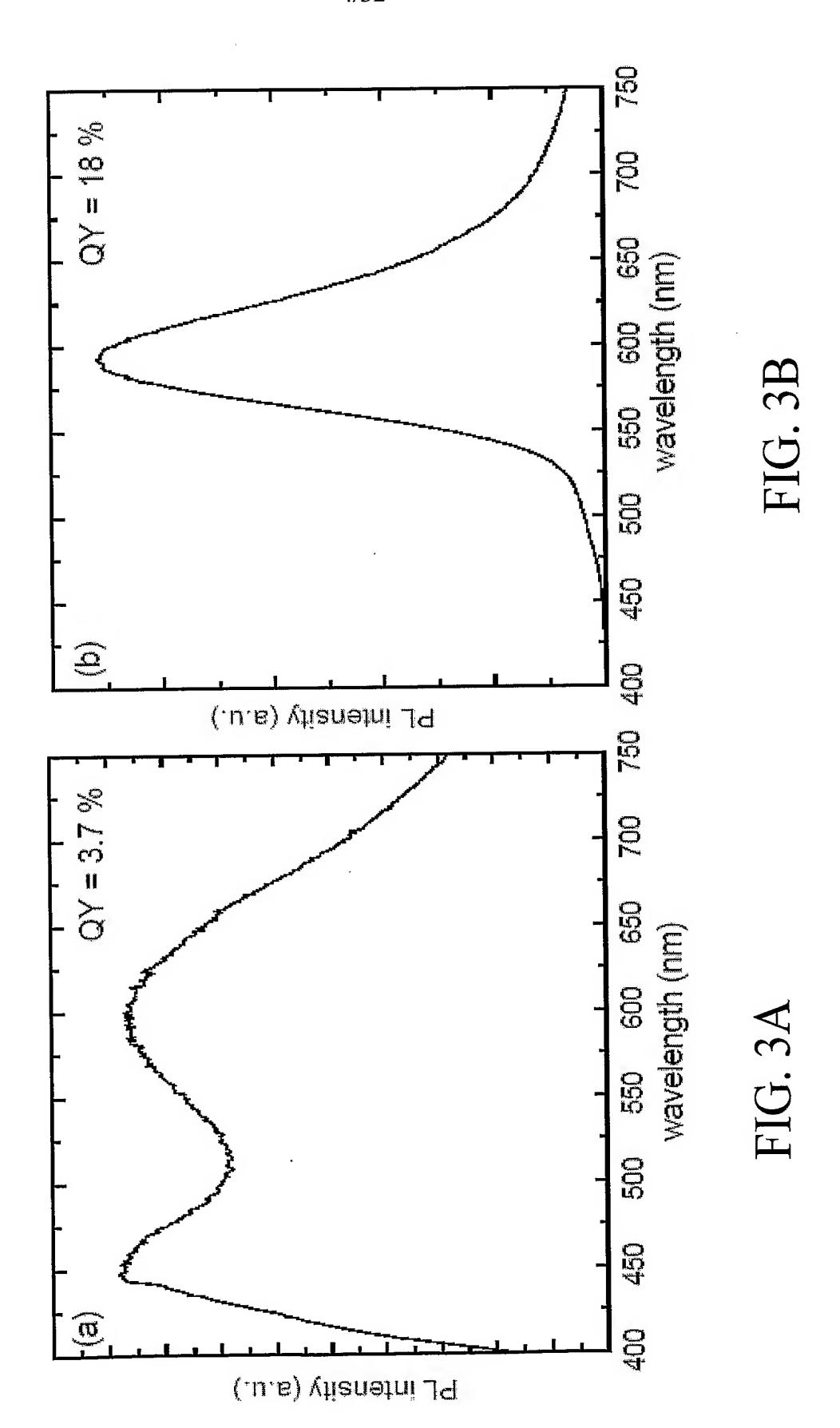


FIG. 2B



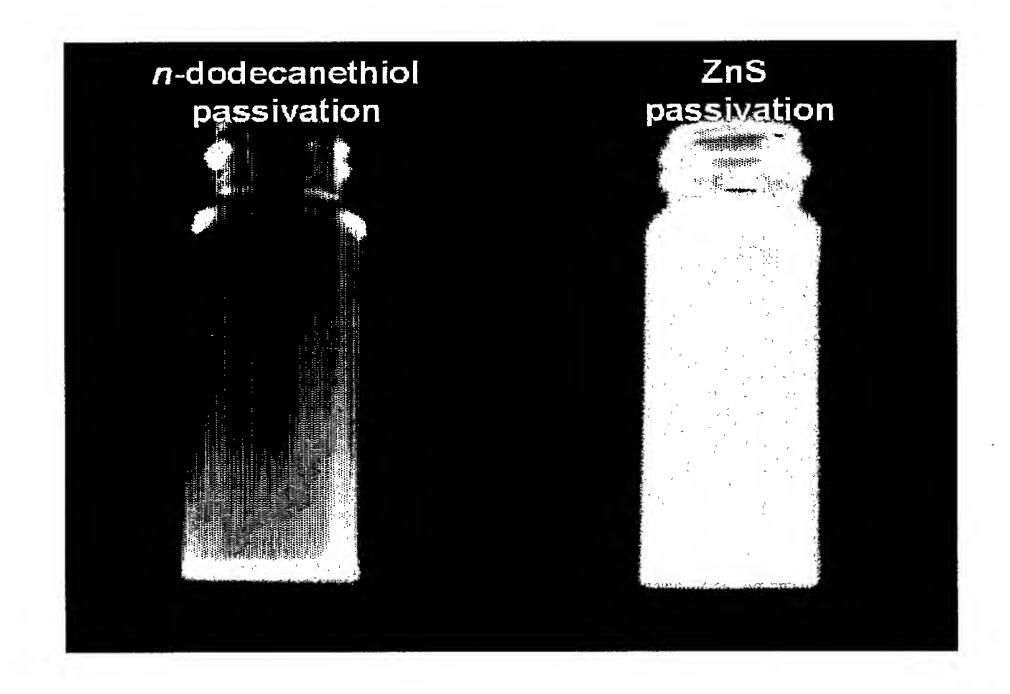


FIG. 4

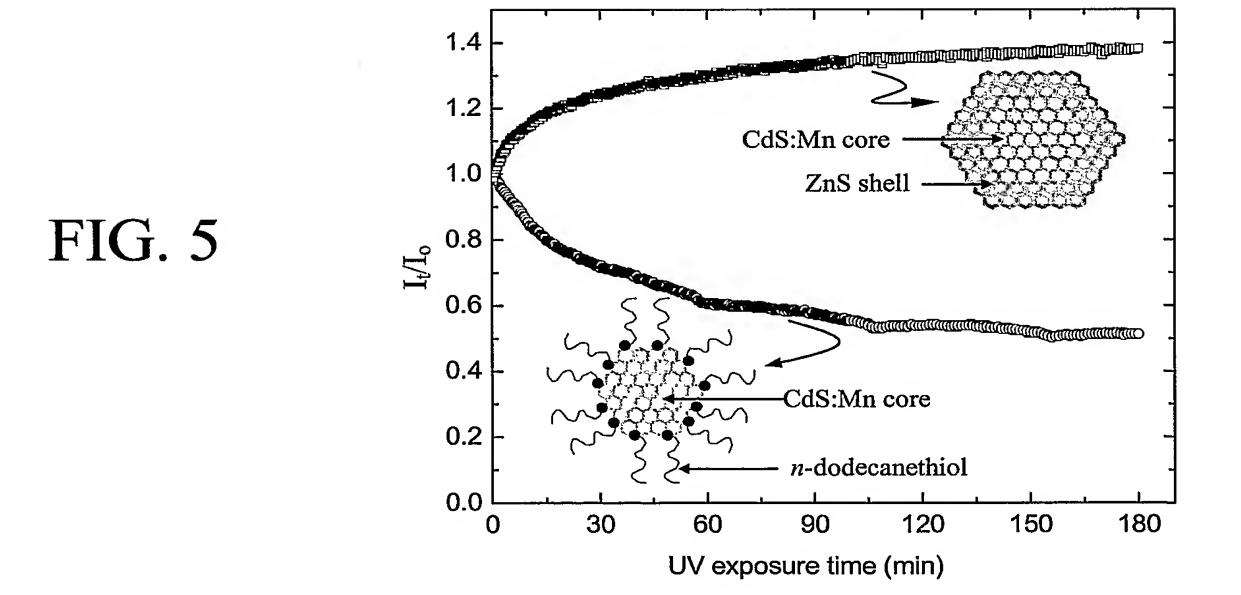


FIG. 6

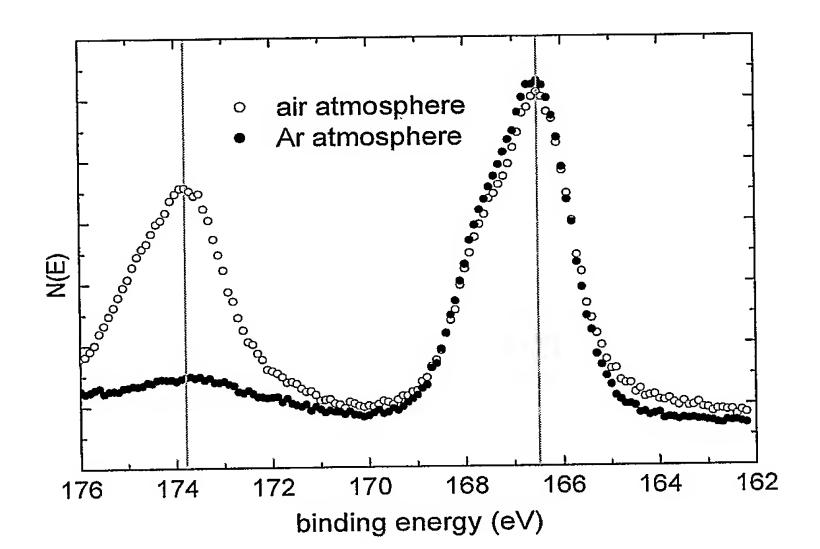
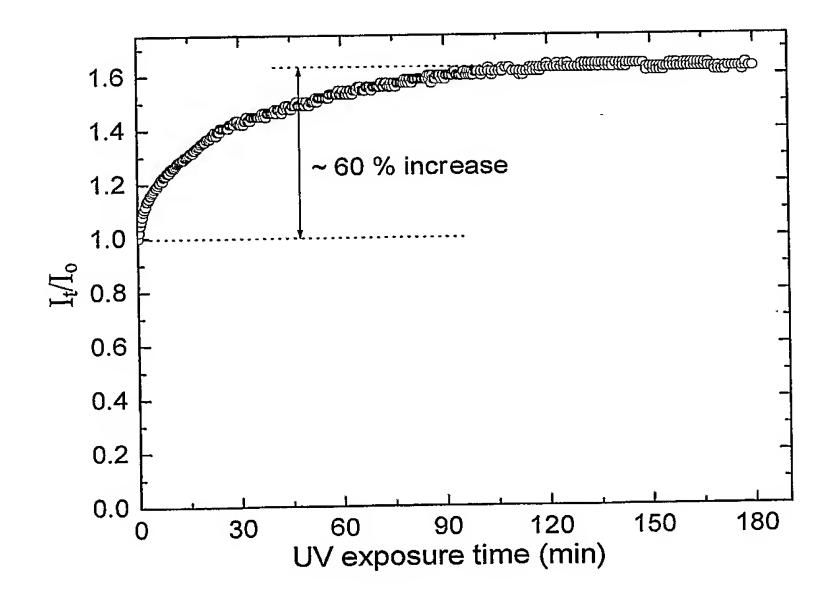
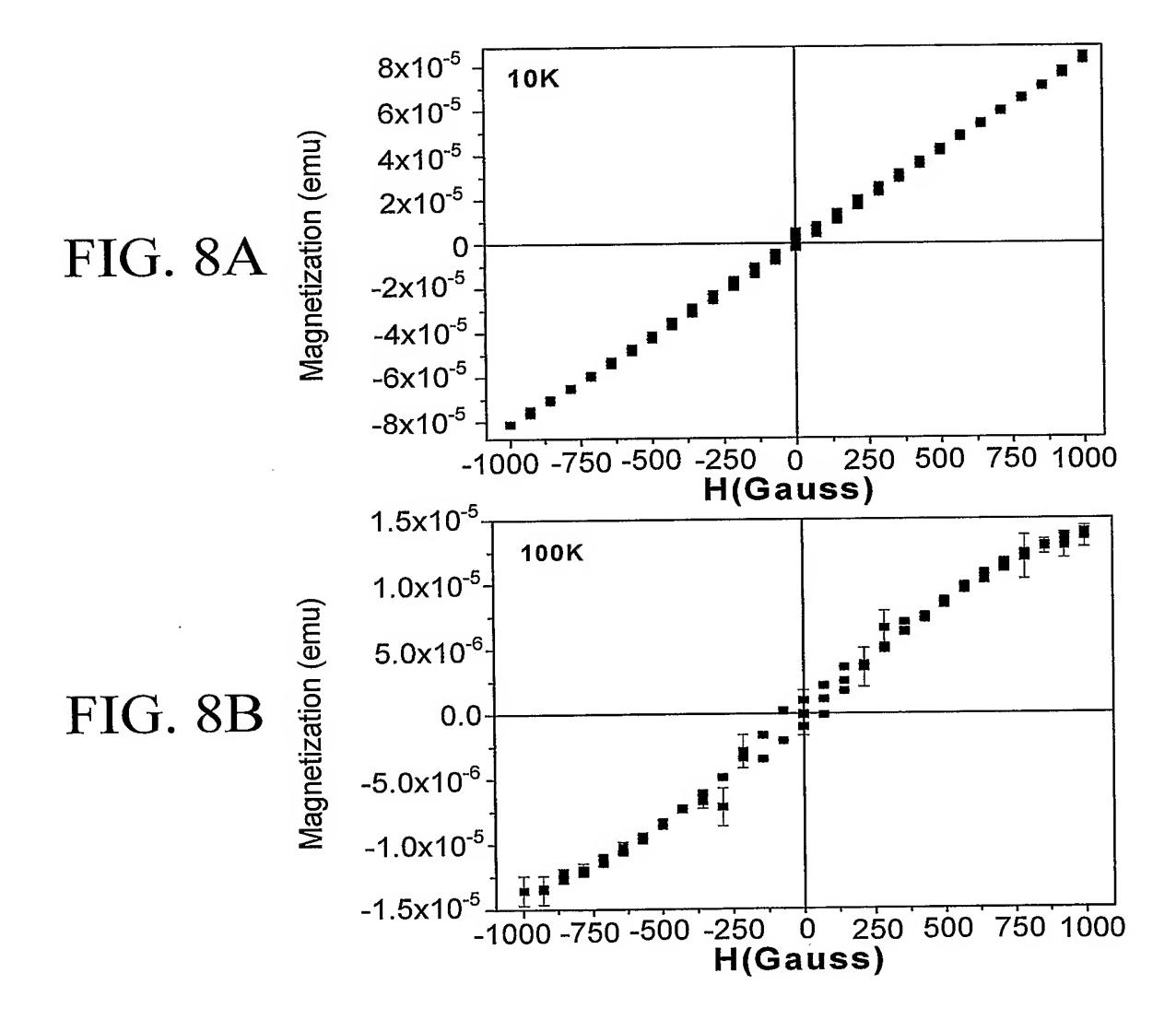
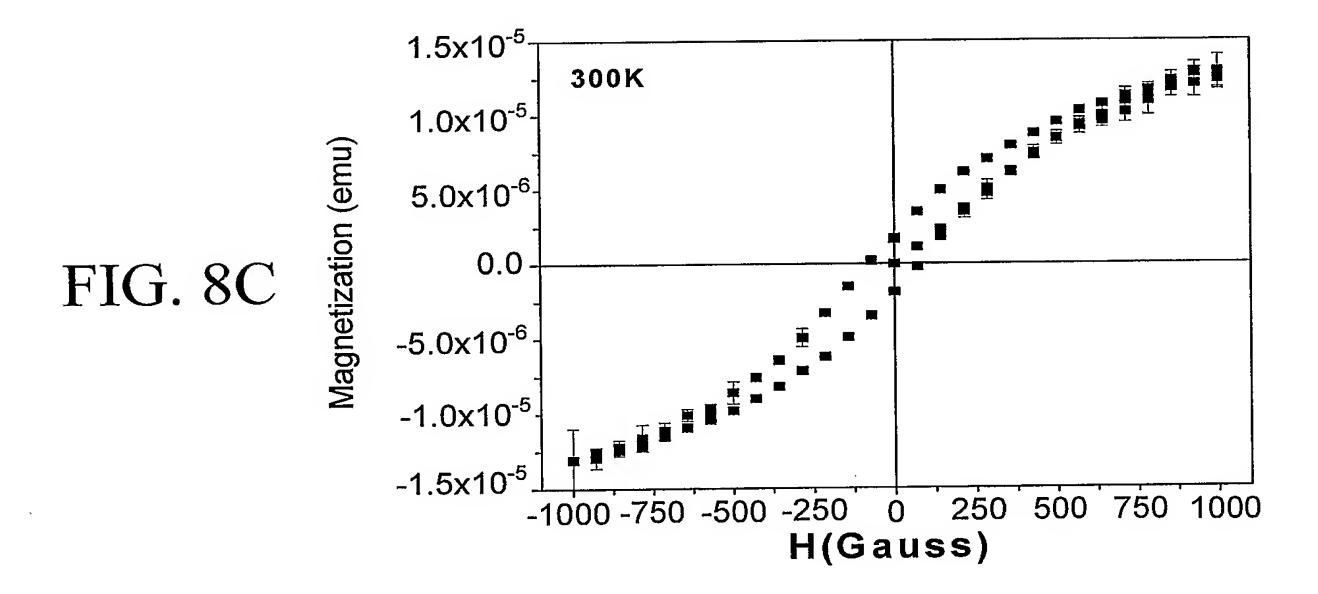
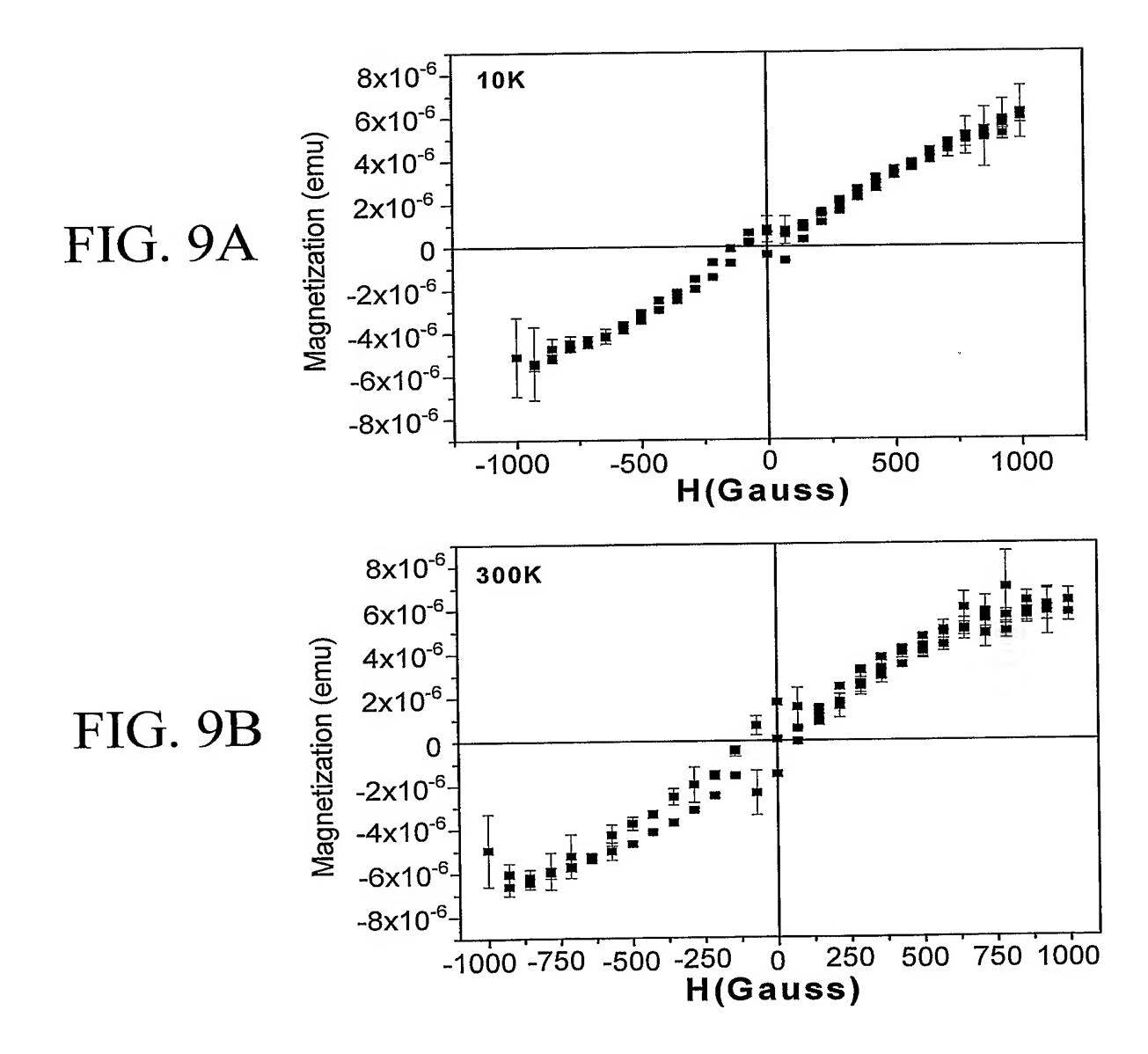


FIG. 7









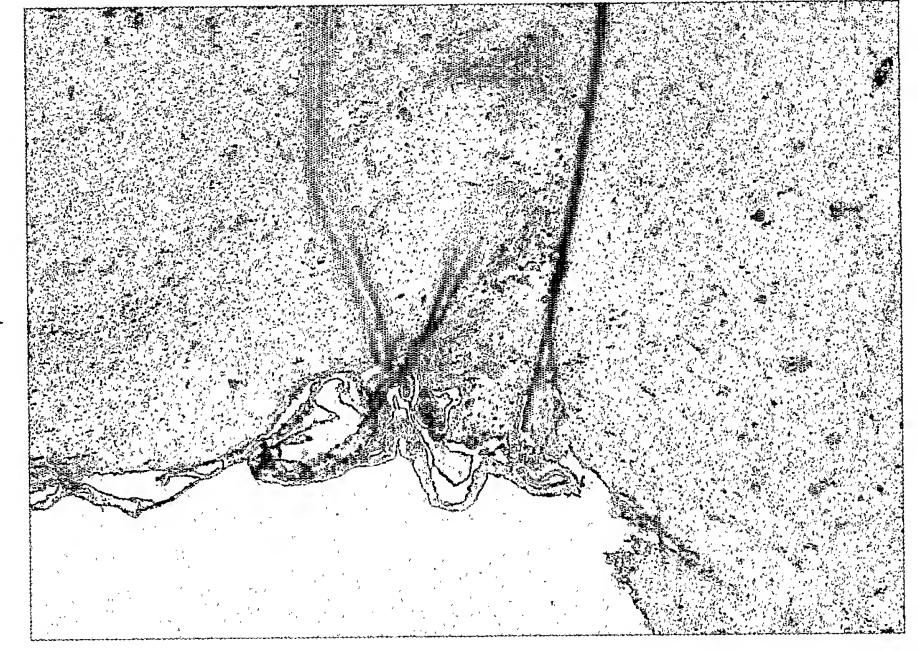


FIG. 10A



FIG. 10B

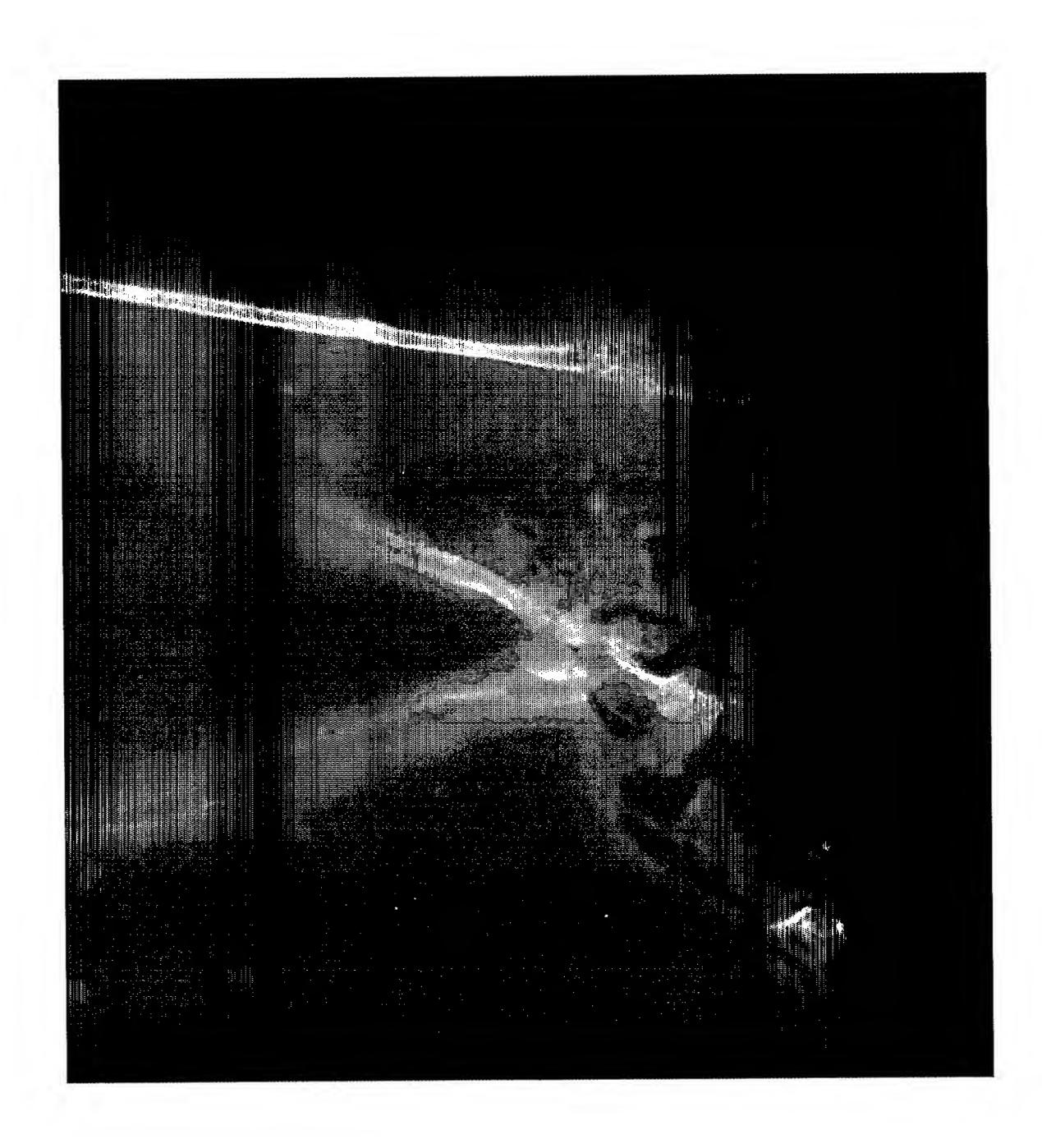


FIG. 11

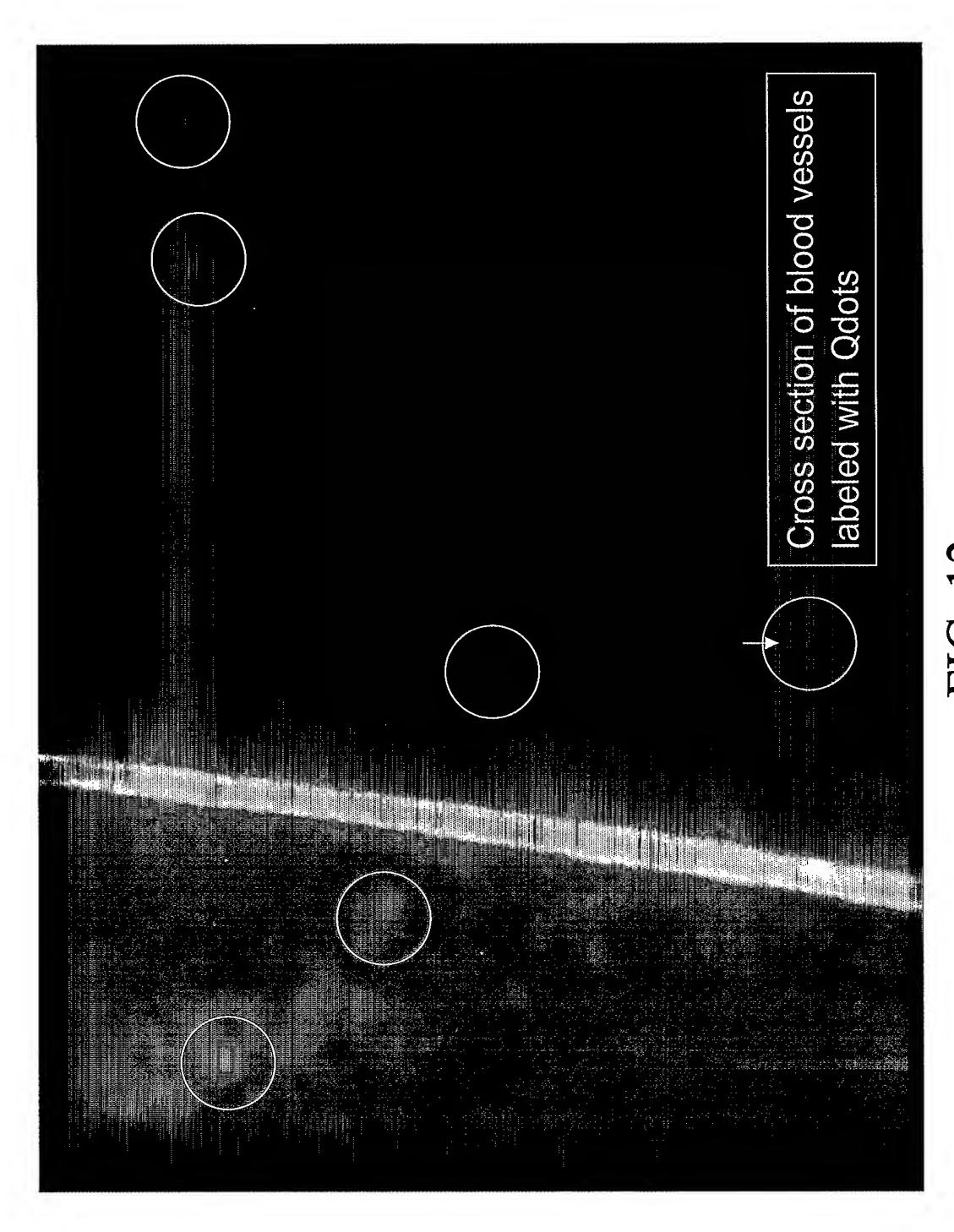


FIG. 12

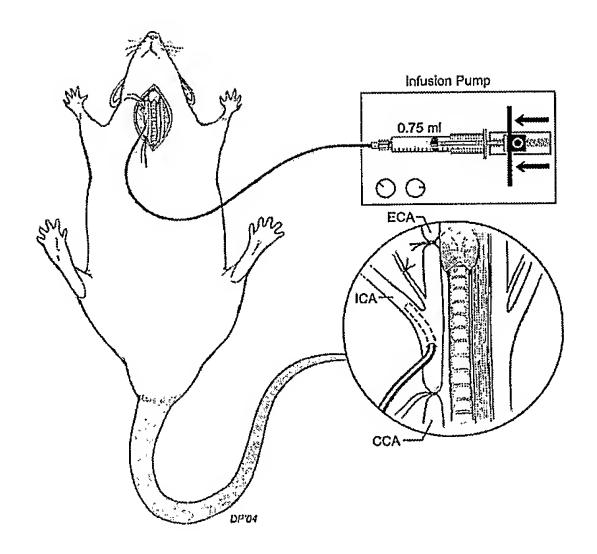


FIG. 13

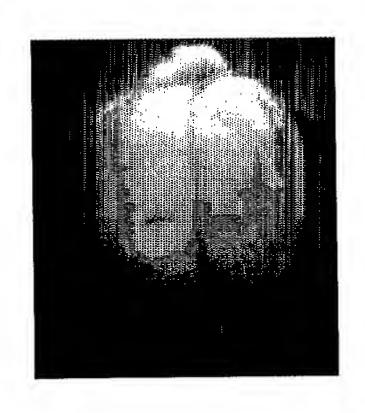


FIG. 14A

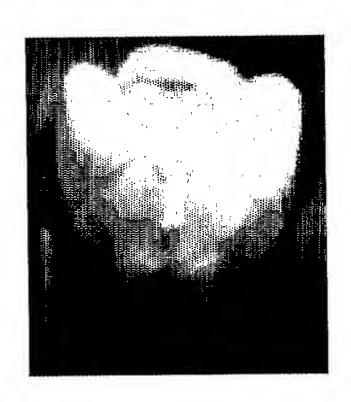


FIG. 14B



FIG. 14C

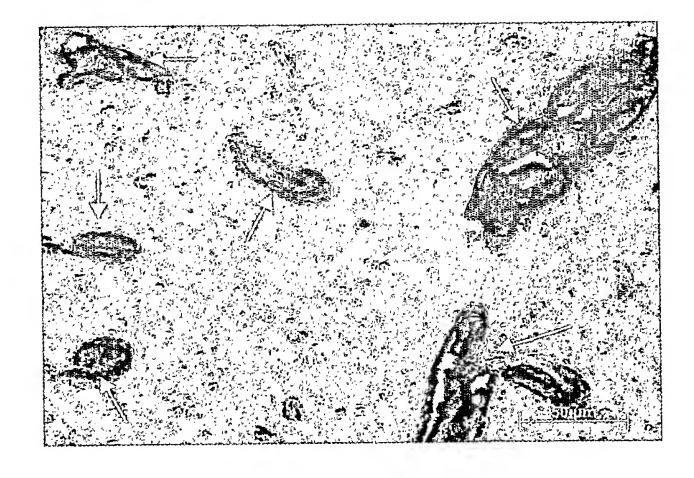


FIG. 15A

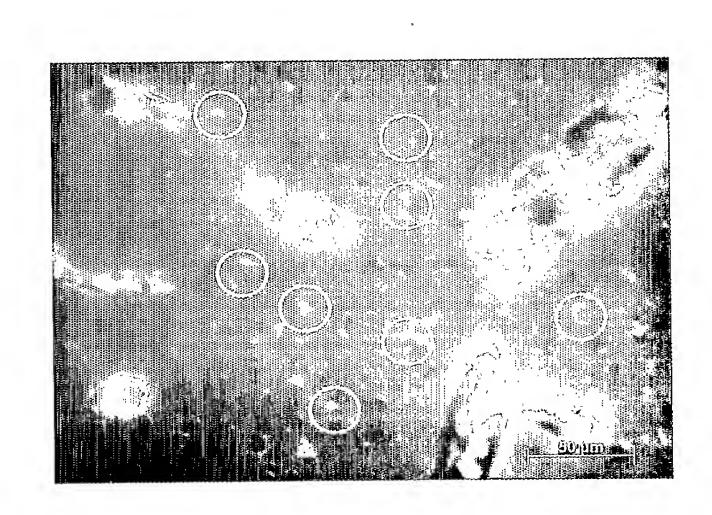
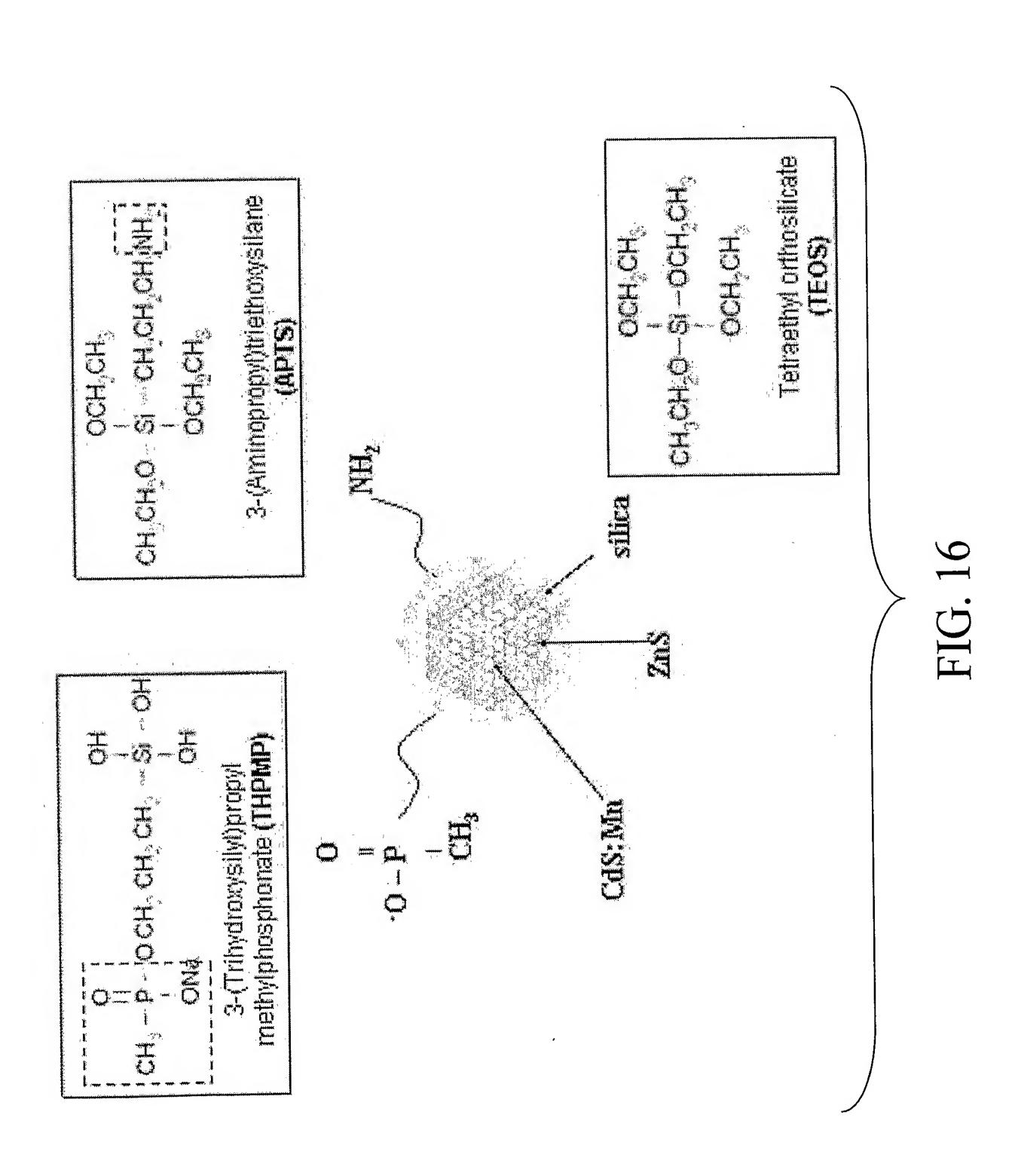
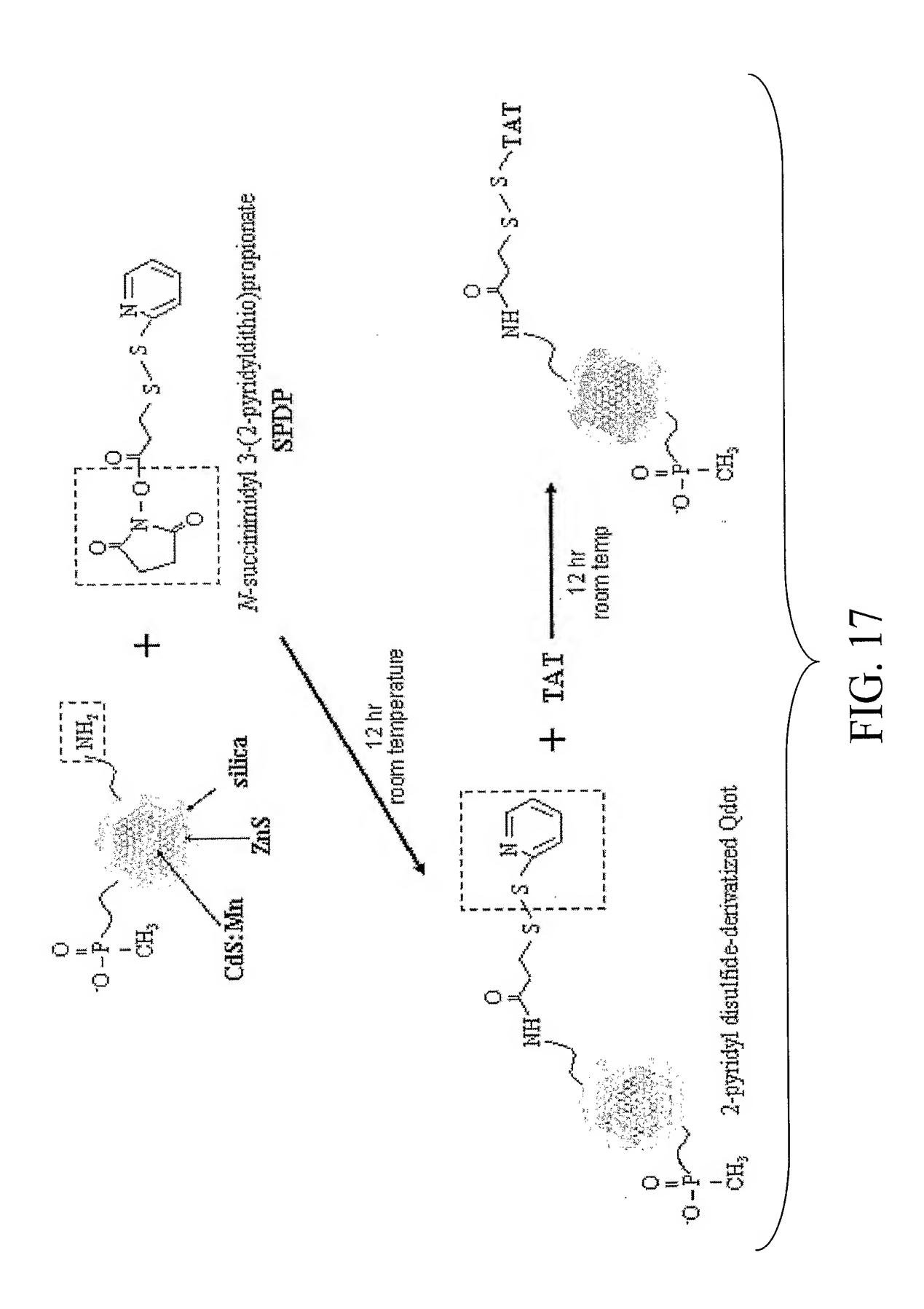
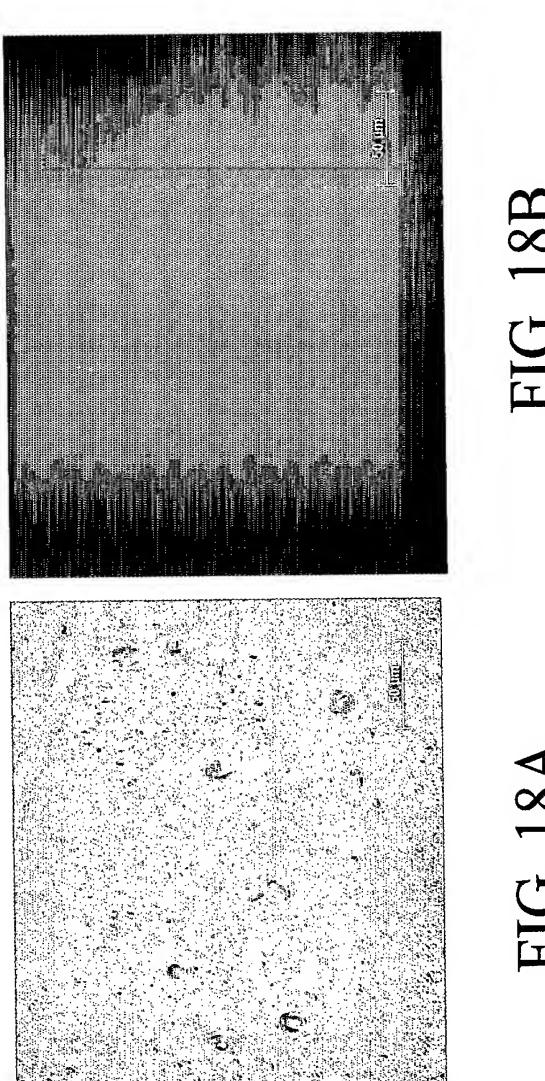


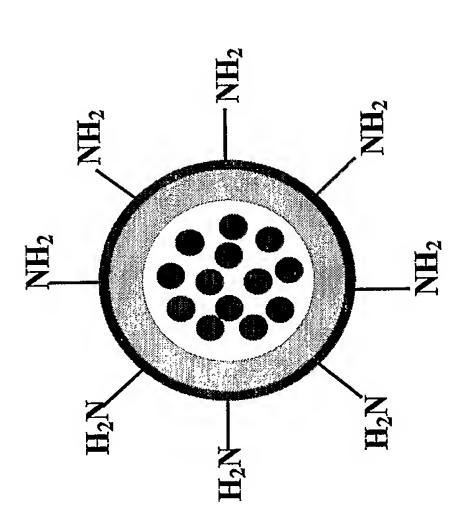
FIG. 15B







IG. 18A



Fluorescent dye (Rubpy) doped silica core

Paramagnetic (gadolinium (III) ion bound) inner silica shell for MRI

functionalized outer silica shell for bioconjugation Primary amine (-NH<sub>2</sub>)

FIG. 15

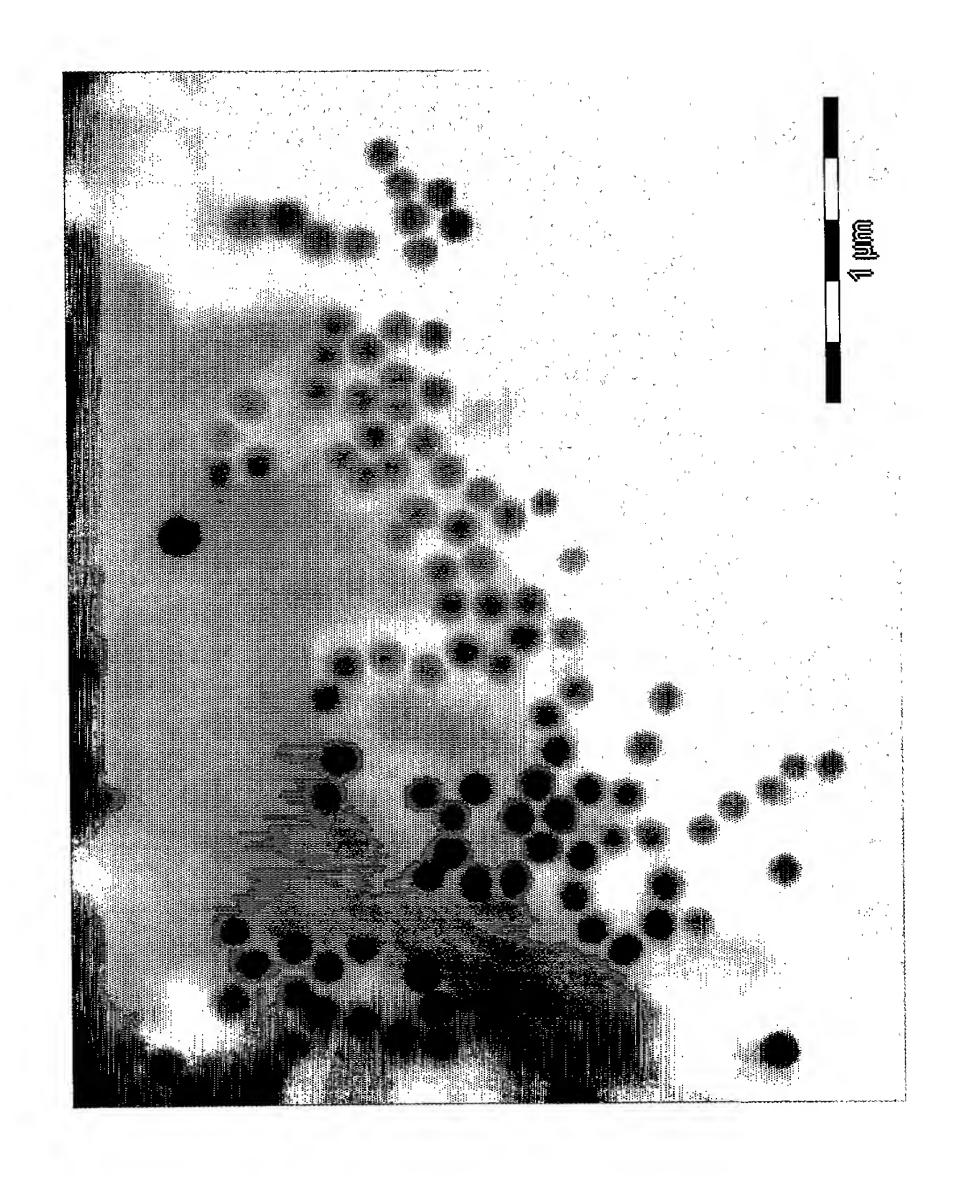


FIG. 20

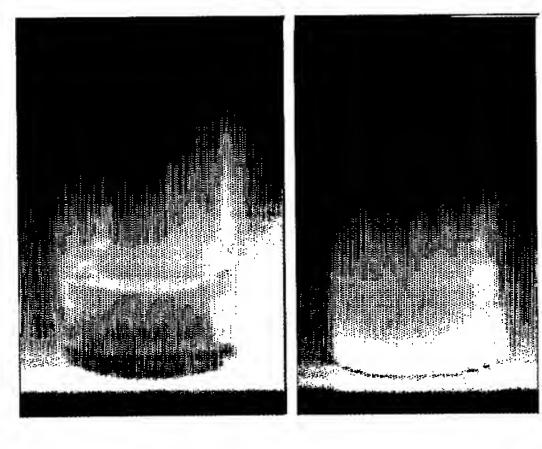
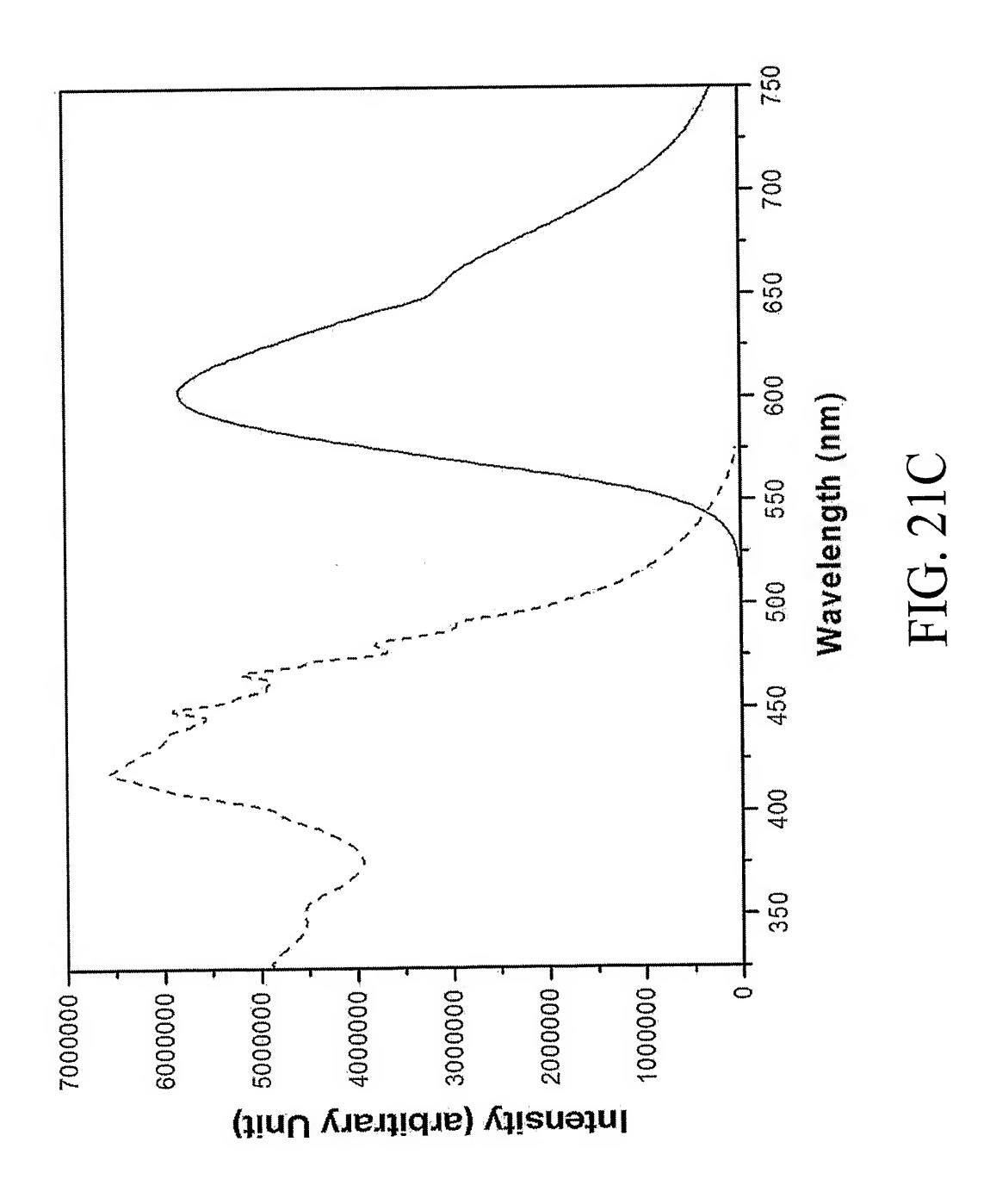


FIG. 21A FIG. 21B



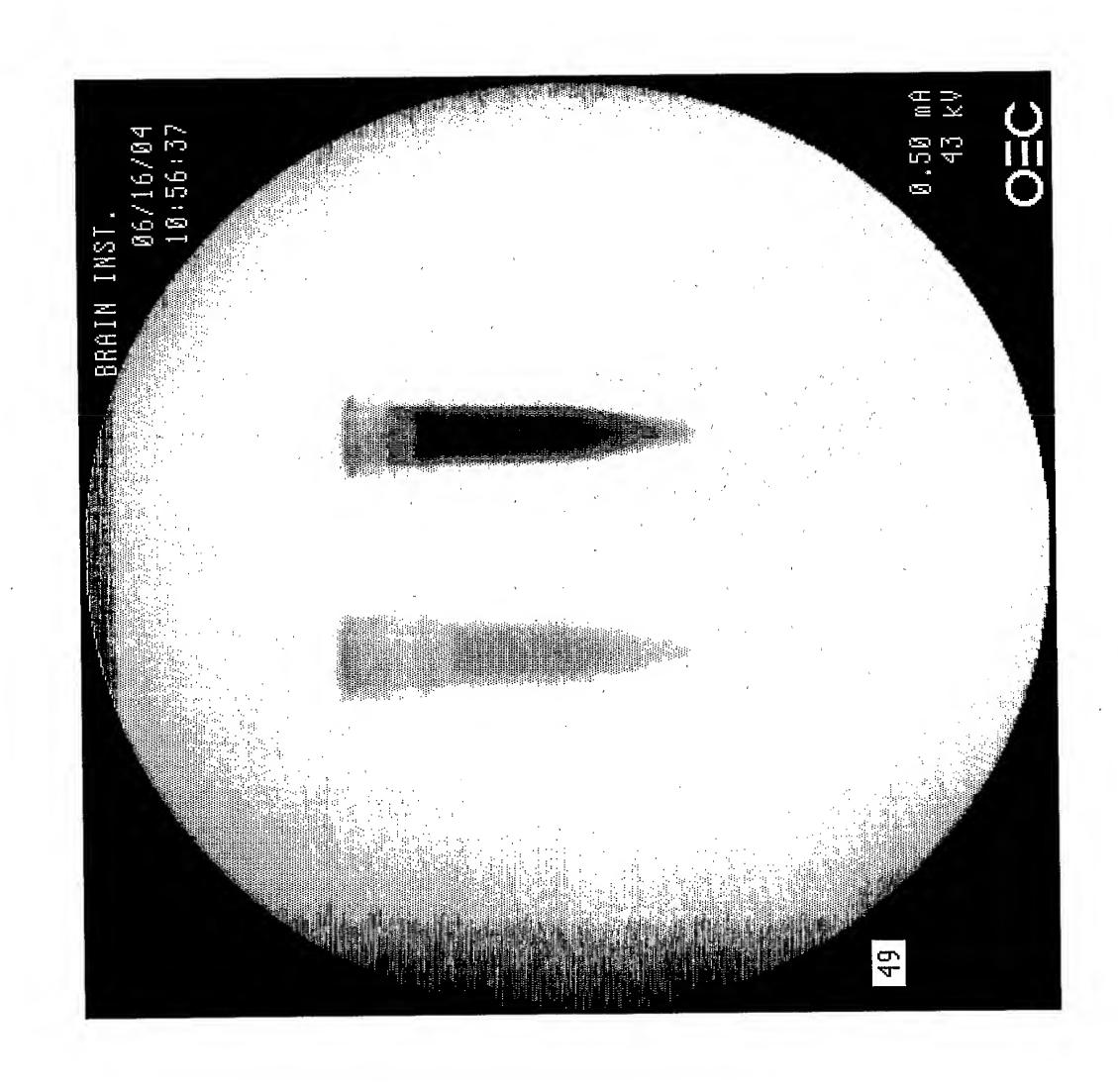


FIG. 22

 $T_1$  Weighted

0.12 mM  $dH_20$ 0.015 mM

Prohance
(0.06 mM)

0.06 mM

FIG. 23A

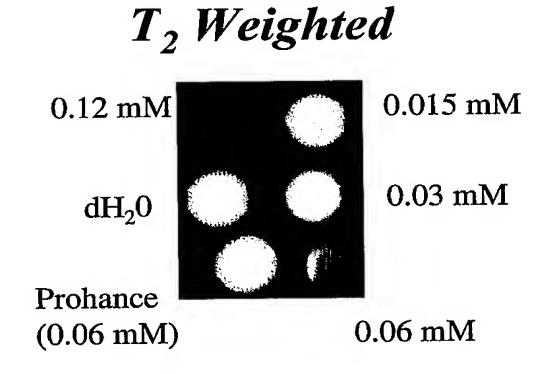
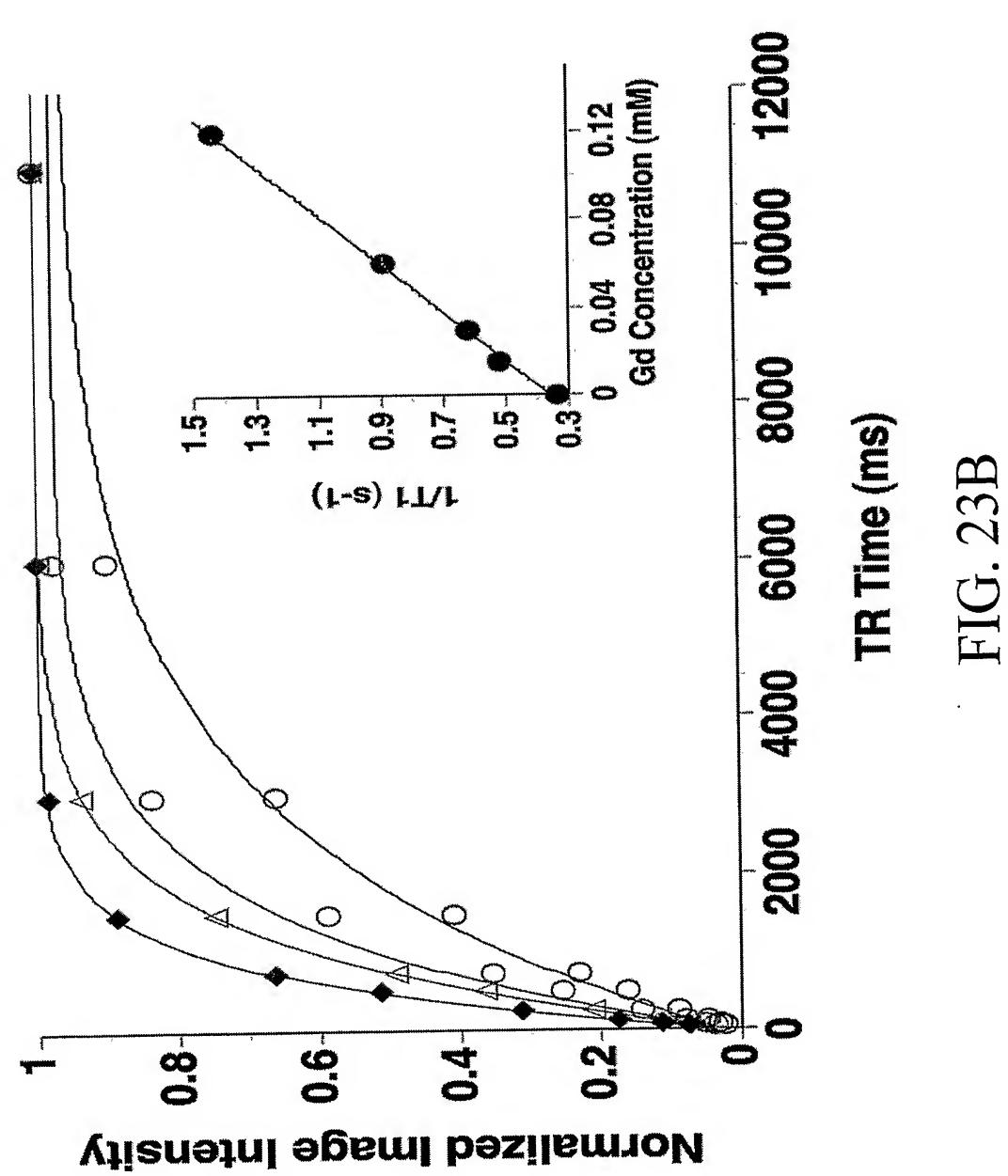
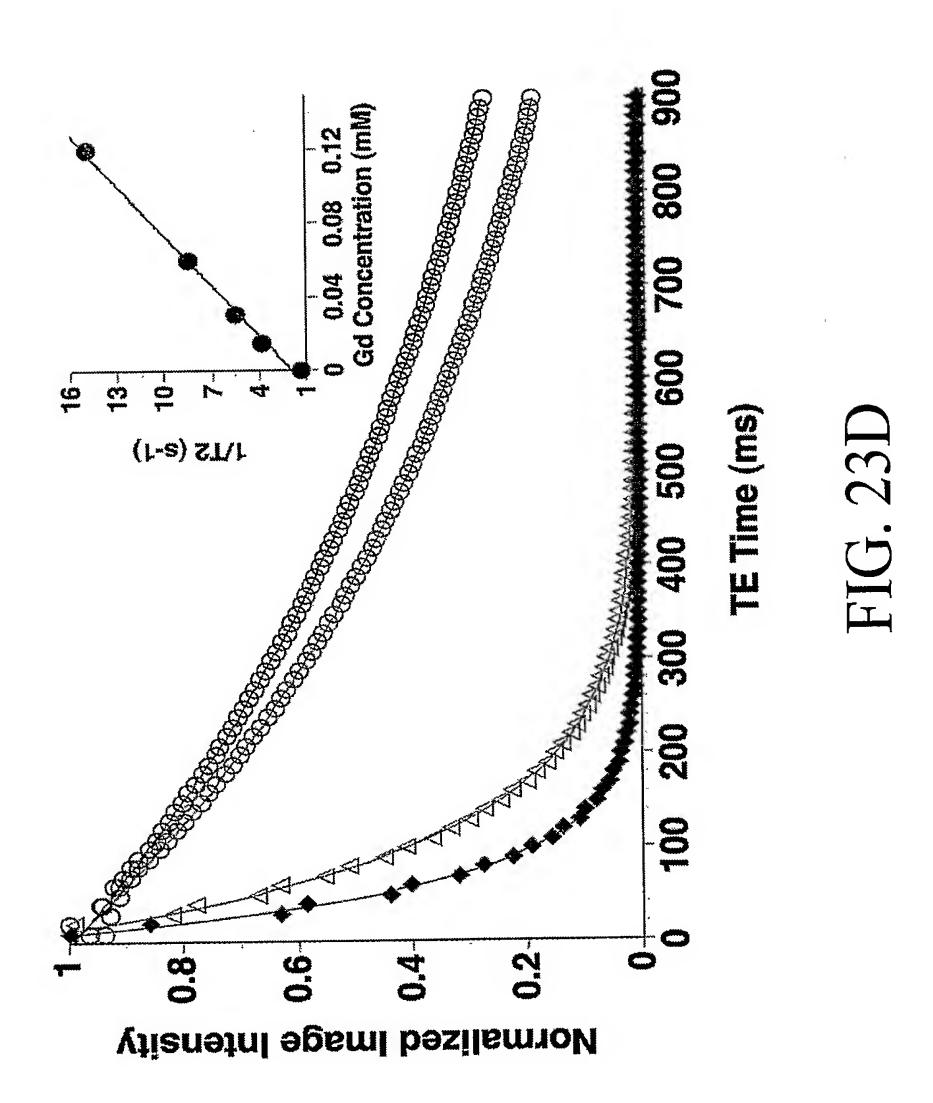


FIG. 23C





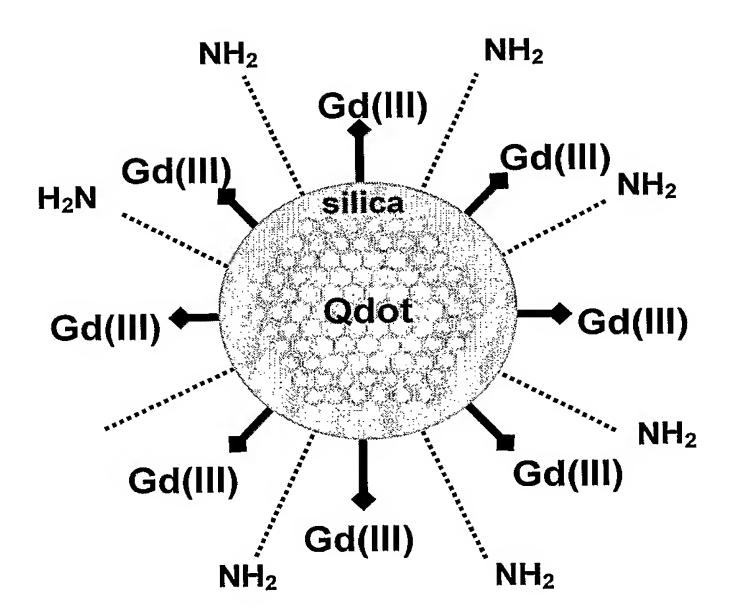
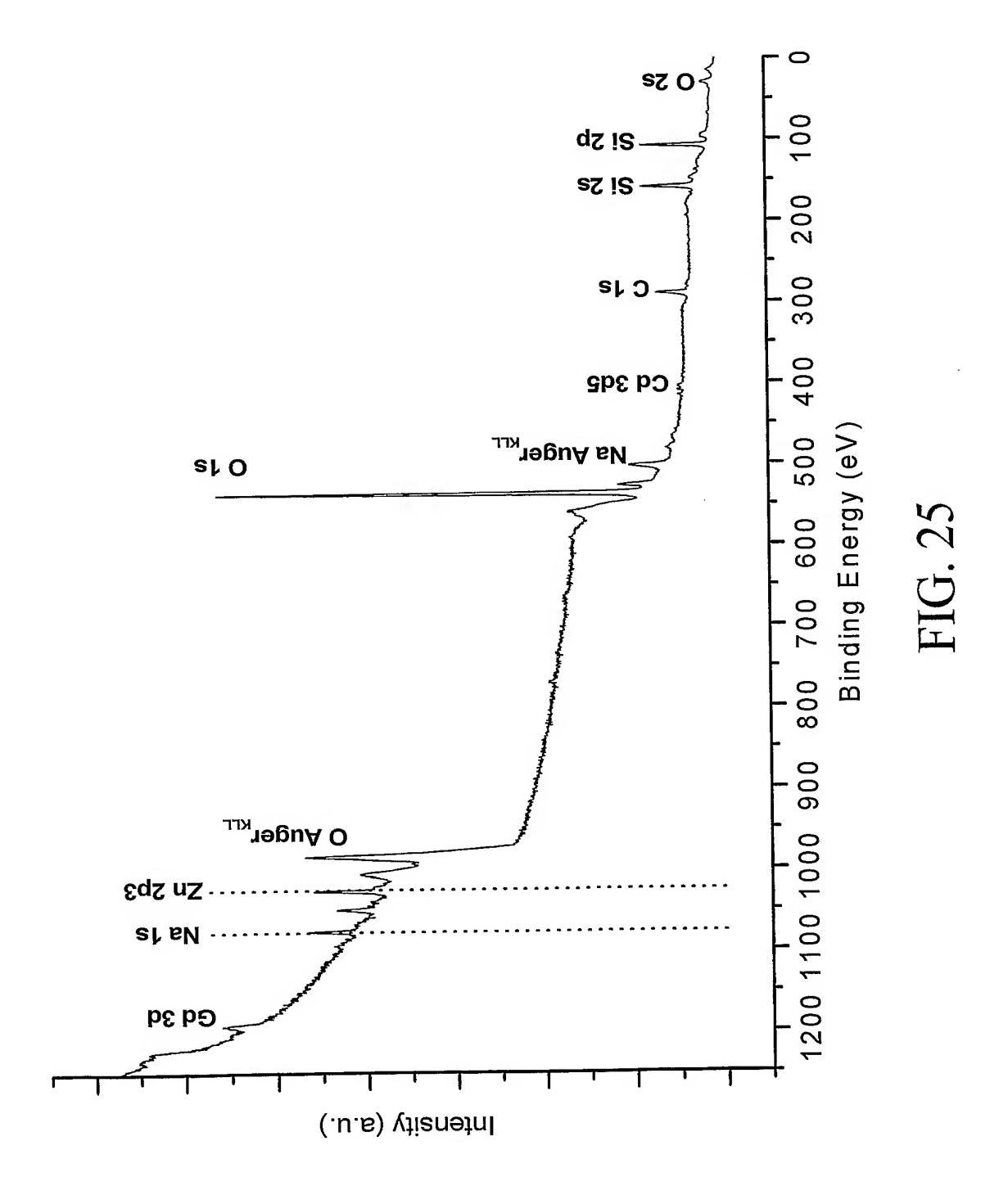


FIG. 24



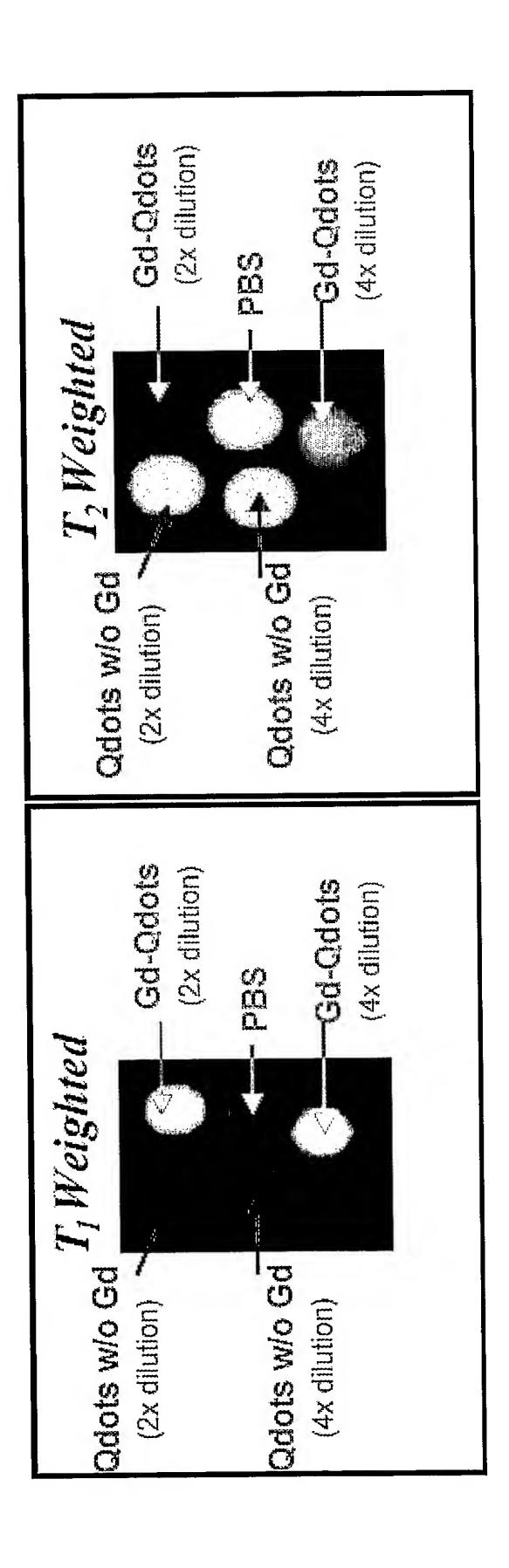
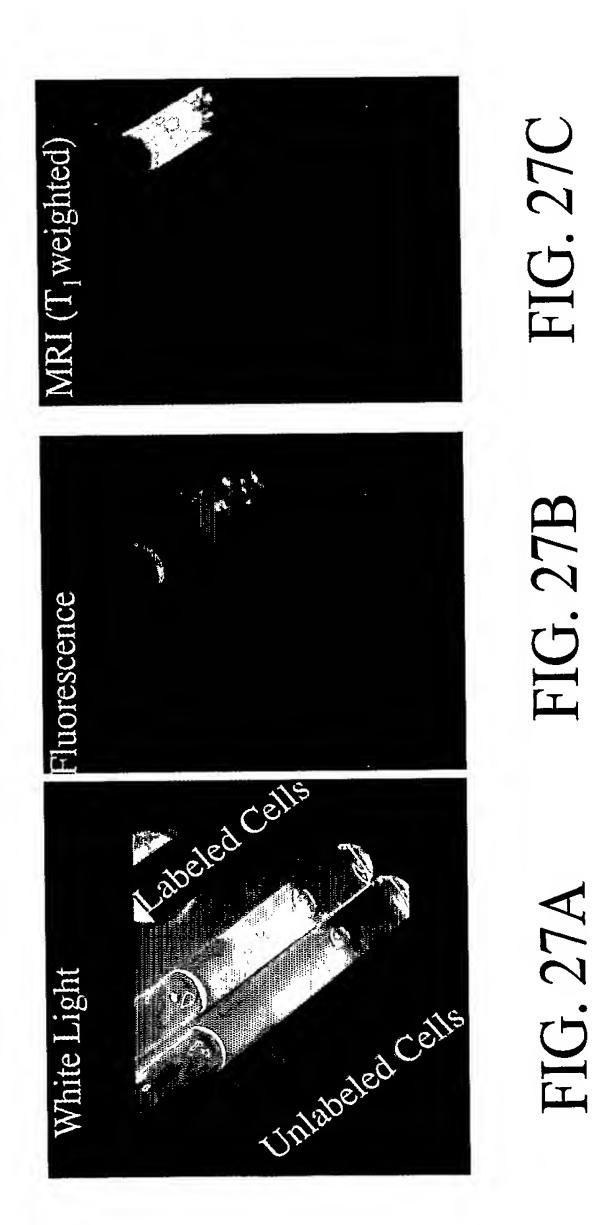


FIG. 26B

FIG. 26A



31/32

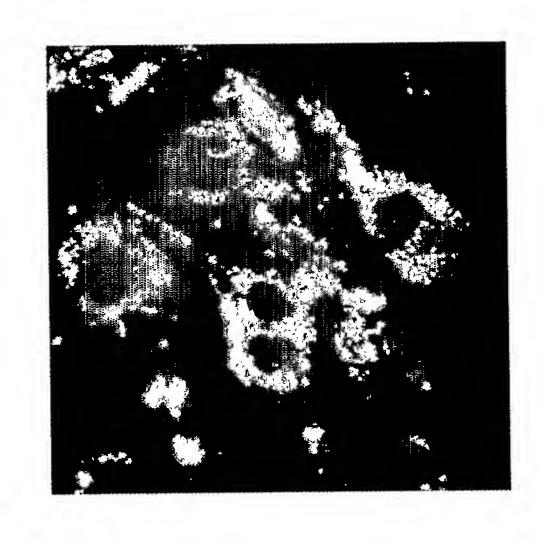


FIG. 28B

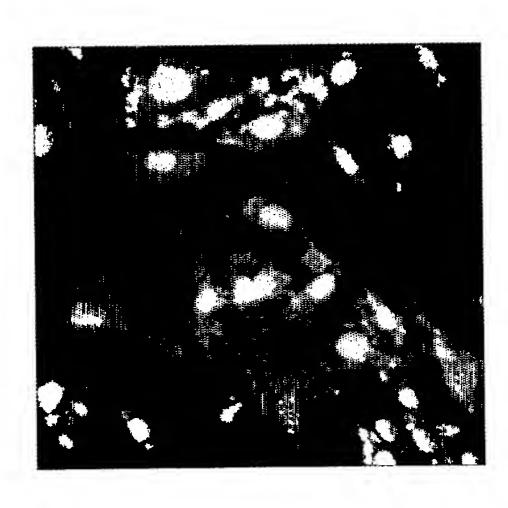


FIG. 28A

